

## Appendix H

### Detailed Cost Estimate and Cost Analysis

#### Project Goals and Objectives

The feasibility study is the first phase of the two-phased USACE planning process. The purpose of this feasibility study is to evaluate all reasonable solutions to aquatic ecosystem degradation identified along this portion of the San Antonio River. This integrated feasibility document provides the basis for a decision document on project construction.

#### SPECIFIC PLANNING OBJECTIVES

Planning objectives reflect an expression of public and professional issues or concerns about the use of water and related land resources resulting from the analysis of existing and future conditions in the study area. These planning objectives were used in guiding the development of alternative plans and their evaluation for the period of analysis. The following planning objectives were used in formulation and evaluation of alternative plans:

- To restore aquatic ecosystem function and structure to the River Road segment of the San Antonio River for a 50 year period of analysis
- Restore riparian habitat quality over the 50 year period of analysis
- Reduce erosive threat to the roads that parallel the river over the 50 year period of analysis
- Maintain pedestrian access in the project area over the 50 year period of analysis
- To provide an economically efficient solution

#### Methodology

To arrive at the current costs for each of the alternative, the MII V 4.4 software and 2016 cost books (latest available versions) were used for plan formulation and then the final numbers for the Tentatively Selected Plan (TSP) were updated to the newer MII V 4.4.2 and 2016 cost books, and escalated to current pricing. This is the most current version of the MCACES software. The remaining measures in the estimate are broken out based on the Civil Works Work Breakdown Structure (CWWBS). The project had multiple flood risk management and mitigation options. After going through all of them the final

options for the Tentatively Selected Plan were developed. There were three measures and broken out into options with different environmental alternatives. The costs for each were developed and the most cost effective for this project was deemed to be the TSP. The estimate currently includes construction, relocations, plantings, recreation features, PED and Construction Management costs, and contingency.

## **Assumptions and Constraints**

The aquatic ecosystem along the River Road segment of the San Antonio River is severely degraded from excess erosion and sedimentation and threatens the integrity of the two roads that parallel the river. The riparian corridor has been reduced to a narrow strip adjacent to the river bank. This has reduced the natural bank erosion protection provided by the riparian vegetation along the river

The opportunities identified include:

- Restore function and structure to the aquatic ecosystem
- Provide additional recreational and ecotourism benefits to the community
- Improve water quality in the San Antonio River through ecosystem restoration

## **Alternatives**

For each area remaining, the final array of management measures was combined into individual alternatives. Each of these alternatives could be a standalone plan, or combined with other alternatives to form a suite of alternative plans.

### **Alternative 1 – In-stream Modification**

Alternative 1a – Removal of ALL Low Water Crossings - \$3,623,999.00

Alternative 1b – Removal of LWC 2 & 3 and Modification of LWC 1 - \$3,001,365.00

Alternative 1c – Removal of LWC 1 and Modification of 2 & 3 \$2,330,891.00

Alternative 1d – Modification of ALL Low Water Crossings \$1,852,971.00

### **Alternative 2 – Avenue A Modification**

Alternative 2a – Complete removal of Ave A, widen golf course path \$507,600.00

Alternative 2b – Partial removal of Ave A \$194,105.00

### **Alternative 3 – River Road Modification**

Alternative 3a – Partial Removal of River Road, relocate to the west \$609,606.00

Alternative 3b – Leave River Road as is \$216,525.00

## **Recreation Features**

## CE/ICA Table of Best Value Plans

Alternative	Scale	Description
Instream Modification	1A	Removal of Low Water Crossings 1, 2, & 3
	1B	Modification of Low Water Crossing 1 and Removal of Low Water Crossings 2 and 3
	1C	Removal of Low Water Crossing 1 and Modification of Low Water Crossings 2 & 3
	1D	Modification of Low Water Crossings 1, 2, & 3
Avenue A Modification	2A	Complete removal of Avenue A
	2B	Partial removal of Avenue A
River Road	3A	River Road Relocation and Planting in Davis Park
	3B	River Road As-Is and Planting in Davis Park

### Risks

The abbreviated Cost Risk Analysis was completed on 4 May 2020. The risk analysis was based on the individual features of the alternatives and then modified for the TSP. It was broken down by the individual areas with a combined contingency of 19% for the construction pieces and 13% for the PED and 17% for Construction Management. Contingencies for construction features ranged from 10 to 33%. Due to the limited information on the bank sculpting, the in-stream contingency increased from 13% to 16%.

### Tentatively Selected Plan

After analyzing the costs and the risks associated with the various alternatives and running the CEICA, the recommended plan is Alternative 1a, 2a, 3b and associated Rec Features. The projected first cost for this project is \$5,757,000.00. After receiving additional information the costs were updated to add in additional costs for CLOMAR and LOMAR, also added in costs for bank, revising the costs to \$5,999,000.00

River Road

Estimated by CESWF  
Designed by CESWF  
Prepared by CESWF

Preparation Date 11/5/2020  
Effective Date of Pricing 11/5/2020  
Estimated Construction Time 365 Days

Description	Quantity	UOM	ProjectCost
<b>PROJECT INDIRECT SUMMARY - Scope</b>			<b>4,845,530</b>
<b>1 Tentatively Seleceted Plan</b>	<b>1.00</b>	<b>LS</b>	<b>4,845,530</b>
			<i>110,430.00</i>
<b>1.1 01 Real Estate Cost</b>	<b>1.00</b>	<b>EA</b>	<b>110,430</b>
			<i>56,655.00</i>
<b>1.1.1 Alternative 1</b>	<b>1.00</b>	<b>EA</b>	<b>56,655</b>
			<i>16,950.00</i>
<b>1.1.2 Alternative 2</b>	<b>1.00</b>	<b>EA</b>	<b>16,950</b>
			<i>36,825.00</i>
<b>1.1.3 Alternative 3</b>	<b>1.00</b>	<b>EA</b>	<b>36,825</b>
			<i>553,351.45</i>
<b>1.2 06 Fish &amp; Wildlife Construction</b>	<b>1.00</b>	<b>EA</b>	<b>553,351</b>
			<i>83,372.81</i>
<b>1.2.1 Demolish Existing Low Water Crossing</b>	<b>3.00</b>	<b>EA</b>	<b>250,118</b>
			<i>46.21</i>
<b>1.2.2 Remove Ave A Asphalt and Base and Replace with Native Soil</b>	<b>5,763.33</b>	<b>SY</b>	<b>266,304</b>
			<i>17.34</i>
<b>1.2.3 Construct Golf Cart Path</b>	<b>2,130.00</b>	<b>LF</b>	<b>36,929</b>
			<i>521,293.00</i>
<b>1.3 06 Fish &amp; Wildlife - Plantings</b>	<b>1.00</b>	<b>EA</b>	<b>521,293</b>
			<i>521,293.00</i>
<b>1.3.1 Planting - LAERF costs</b>	<b>1.00</b>	<b>EA</b>	<b>521,293</b>
			<i>1,372,221.70</i>
<b>1.4 08 Roads and Bridges</b>	<b>1.00</b>	<b>EA</b>	<b>1,372,222</b>
			<i>550,751.64</i>
<b>1.4.1 Construct Light Duty Bridge</b>	<b>2.00</b>	<b>EA</b>	<b>1,101,503</b>
			<i>410.18</i>
<b>1.4.2 Smaller Pedestrian Bridge</b>	<b>660.00</b>	<b>SF</b>	<b>270,718</b>
			<i>243,032.08</i>
<b>1.5 14 Recreition Facilities</b>	<b>1.00</b>	<b>EA</b>	<b>243,032</b>
			<i>929,484.41</i>
<b>1.5.1 Recreation Features</b>	<b>1.00</b>	<b>LS</b>	<b>243,032</b>
			<i>110,363.48</i>
<b>1.6 15 Floodway Control &amp; Diversion Strucutres</b>	<b>1.00</b>	<b>EA</b>	<b>929,484</b>
			<i>772,544</i>
<b>1.6.1 In-stream Structures</b>	<b>7.00</b>	<b>EA</b>	<b>772,544</b>

<b>Description</b>	<b>Quantity</b>	<b>UOM</b>	<b>ProjectCost</b>
<b>1.6.2 Construct Boulder Barrier</b>	<b>1.00</b>	<b>EA</b>	<i>156,940.04</i> <b>156,940</b>
<b>1.7 30 - PED</b>	<b>1.00</b>	<b>EA</b>	<i>712,966.02</i> <b>712,966</b>
<b>1.7.1 Map Revisions</b>	<b>1.00</b>	<b>LS</b>	<b>50,000</b>
<b>1.7.2 Adaptive Management</b>	<b>1.00</b>	<b>LS</b>	<b>105,310</b>
<b>1.7.3 Construction features</b>	<b>1.00</b>	<b>EA</b>	<i>513,910.26</i> <b>513,910</b>
<b>1.7.4 Rec features</b>	<b>1.00</b>	<b>EA</b>	<i>43,745.76</i> <b>43,746</b>
<b>1.8 31 - CM</b>	<b>1.00</b>	<b>EA</b>	<i>402,751.57</i> <b>402,752</b>
<b>1.8.1 Recreation</b>	<b>1.00</b>	<b>EA</b>	<i>31,594.16</i> <b>31,594</b>
<b>1.8.2 Construction features</b>	<b>1.00</b>	<b>EA</b>	<i>371,157.41</i> <b>371,157</b>

Description	Quantity	UOM	ContractCost	Contingency	ProjectCost
<b>PROJECT INDIRECT SUMMARY - System</b>			<b>4,845,530</b>	<b>0</b>	<b>4,845,530</b>
<b>1 Tentatively Seleceted Plan</b>	<b>1.00</b>	<b>LS</b>	<b>4,845,530</b>	<b>0</b>	<b>4,845,530</b>
<b>1.1 01 Real Estate Cost</b>	<b>1.00</b>	<b>EA</b>	<b>110,430</b>	<b>0</b>	<b>110,430</b>
<b>1.1.1 Alternative 1</b>	<b>1.00</b>	<b>EA</b>	<b>56,655</b>	<b>0</b>	<b>56,655</b>
<b>1.1.2 Alternative 2</b>	<b>1.00</b>	<b>EA</b>	<b>16,950</b>	<b>0</b>	<b>16,950</b>
<b>1.1.3 Alternative 3</b>	<b>1.00</b>	<b>EA</b>	<b>36,825</b>	<b>0</b>	<b>36,825</b>
<b>1.2 06 Fish &amp; Wildlife Construction</b>	<b>1.00</b>	<b>EA</b>	<b>553,351</b>	<b>0</b>	<b>553,351</b>
<b>1.2.1 Demolish Existing Low Water Crossing</b>	<b>3.00</b>	<b>EA</b>	<b>250,118</b>	<b>0</b>	<b>250,118</b>
<b>1.2.2 Remove Ave A Asphalt and Base and Replace with Native Soil</b>	<b>5,763.33</b>	<b>SY</b>	<b>266,304</b>	<b>0</b>	<b>266,304</b>
<b>1.2.3 Construct Golf Cart Path</b>	<b>2,130.00</b>	<b>LF</b>	<b>36,929</b>	<b>0</b>	<b>36,929</b>
<b>1.2.3.1 Chain Link Gate Across Ave A</b>	<b>1.00</b>	<b>EA</b>	<b>7,551</b>	<b>0</b>	<b>7,551</b>
<b>1.3 06 Fish &amp; Wildlife - Plantings</b>	<b>1.00</b>	<b>EA</b>	<b>521,293</b>	<b>0</b>	<b>521,293</b>
<b>1.3.1 Planting - LAERF costs</b>	<b>1.00</b>	<b>EA</b>	<b>521,293</b>	<b>0</b>	<b>521,293</b>
<b>1.3.1.1 Alternative 2</b>	<b>1.00</b>	<b>EA</b>	<b>84,078</b>	<b>0</b>	<b>84,078</b>
<b>1.3.1.2 Alternative 3</b>	<b>1.00</b>	<b>EA</b>	<b>84,943</b>	<b>0</b>	<b>84,943</b>
<b>1.3.1.3 Alternative 1</b>	<b>1.00</b>	<b>EA</b>	<b>352,272</b>	<b>0</b>	<b>352,272</b>
<b>1.4 08 Roads and Bridges</b>	<b>1.00</b>	<b>EA</b>	<b>1,372,222</b>	<b>0</b>	<b>1,372,222</b>
<b>1.4.1 Construct Light Duty Bridge</b>	<b>2.00</b>	<b>EA</b>	<b>1,101,503</b>	<b>0</b>	<b>1,101,503</b>
<b>1.4.2 Smaller Pedestrian Bridge</b>	<b>660.00</b>	<b>SF</b>	<b>270,718</b>	<b>0</b>	<b>270,718</b>

Description	Quantity	UOM	ContractCost	Contingency	ProjectCost
			243,032.08		243,032.08
<b>1.5 14 Recreion Facilities</b>	<b>1.00</b>	<b>EA</b>	<b>243,032</b>	<b>0</b>	<b>243,032</b>
<b>1.5.1 Recreation Features</b>	<b>1.00</b>	<b>LS</b>	<b>243,032</b>	<b>0</b>	<b>243,032</b>
<b>1.5.1.1 Construct ADA Compliant Asphalt Path 2 A</b>	<b>2,450.00</b>	<b>LF</b>	<b>204,763</b>	<b>0</b>	<b>204,763</b>
<b>1.5.1.2 Misc Amenities</b>	<b>1.00</b>	<b>EA</b>	<b>38,269</b>	<b>0</b>	<b>38,269</b>
<b>1.6 15 Floodway Control &amp; Diversion Strucutres</b>	<b>1.00</b>	<b>EA</b>	<b>929,484</b>	<b>0</b>	<b>929,484</b>
<b>1.6.1 In-stream Structures</b>	<b>7.00</b>	<b>EA</b>	<b>772,544</b>	<b>0</b>	<b>772,544</b>
<b>1.6.1.1 Bank Stabilization</b>	<b>1.00</b>	<b>LS</b>	<b>91,538</b>	<b>0</b>	<b>91,538</b>
<b>1.6.1.2 J-Hooks</b>	<b>7.00</b>	<b>EA</b>	<b>681,006</b>	<b>0</b>	<b>681,006</b>
<b>1.6.2 Construct Boulder Barrier</b>	<b>1.00</b>	<b>EA</b>	<b>156,940</b>	<b>0</b>	<b>156,940</b>
<b>1.7 30 - PED</b>	<b>1.00</b>	<b>EA</b>	<b>712,966</b>	<b>0</b>	<b>712,966</b>
<b>1.7.1 Map Revisions</b>	<b>1.00</b>	<b>LS</b>	<b>50,000</b>	<b>0</b>	<b>50,000</b>
<b>1.7.2 Adaptive Management</b>	<b>1.00</b>	<b>LS</b>	<b>105,310</b>	<b>0</b>	<b>105,310</b>
<b>1.7.2.1 Adaptive Management</b>	<b>1.00</b>	<b>EA</b>	<b>73,234</b>	<b>0</b>	<b>73,234</b>
<b>1.7.2.2 Adaptive Management</b>	<b>1.00</b>	<b>EA</b>	<b>16,038</b>	<b>0</b>	<b>16,038</b>
<b>1.7.2.3 Adaptive Management</b>	<b>1.00</b>	<b>EA</b>	<b>16,038</b>	<b>0</b>	<b>16,038</b>
<b>1.7.3 Construction features</b>	<b>1.00</b>	<b>EA</b>	<b>513,910</b>	<b>0</b>	<b>513,910</b>
<b>1.7.4 Rec features</b>	<b>1.00</b>	<b>EA</b>	<b>43,746</b>	<b>0</b>	<b>43,746</b>
<b>1.8 31 - CM</b>	<b>1.00</b>	<b>EA</b>	<b>402,752</b>	<b>0</b>	<b>402,752</b>
<b>1.8.1 Recreation</b>	<b>1.00</b>	<b>EA</b>	<b>31,594</b>	<b>0</b>	<b>31,594</b>
			371,157.41		371,157.41

<u>Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>ContractCost</u>	<u>Contingency</u>	<u>ProjectCost</u>
1.8.2 Construction features	1.00	EA	371,157	0	371,157

**Abbreviated Risk Analysis**

Project (less than \$40M): **River Road**  
 Project Development Stage/Alternative: **Feasibility (Recommended Plan)**  
 Risk Category: **Low Risk: Typical Construction, Simple**

Alternative: **TSP**

Meeting Date: **5/4/2020**

Total Estimated Construction Contract Cost = **\$ 3,619,382**

	<u>CWWBS</u>	<u>Feature of Work</u>	<u>Estimated Cost</u>	<u>% Contingency</u>	<u>\$ Contingency</u>	<u>Total</u>
	01 LANDS AND DAMAGES	Real Estate	\$ 110,430	25%	\$ 27,608	\$ 138,038
1	<b>06 FISH AND WILDLIFE FACILITIES</b>	<b>Demo of LWC</b>	\$ 250,118	26%	\$ 64,107	\$ 314,225
3	<b>06 FISH AND WILDLIFE FACILITIES</b>	<b>Complete Removal of Ave A</b>	\$ 266,304	21%	\$ 56,165	\$ 322,469
5	<b>06 FISH AND WILDLIFE FACILITIES</b>	<b>Widen Golf Course path</b>	\$ 36,929	17%	\$ 6,392	\$ 43,321
7	<b>14 RECREATION FACILITIES</b>	<b>Recreation Features</b>	\$ 243,032	33%	\$ 79,839	\$ 322,871.09
8	<b>15 FLOODWAY CONTROL AND DIVERSION STRUCTURES</b>	<b>Instream Structure</b>	\$ 772,544	16%	\$ 121,407	\$ 893,950.66
9	<b>08 01 ROADS</b>	<b>Small Pedestrian Bridge/Light Duty Bridge</b>	\$ 1,372,222	20%	\$ 271,926	\$ 1,644,147.53
10	<b>15 FLOODWAY CONTROL AND DIVERSION STRUCTURES</b>	<b>Boulder Barrier</b>	\$ 156,940	12%	\$ 18,391	\$ 175,331.44
11		<b>Plantings</b>	\$ 521,293	10%	\$ 52,129	\$ 573,422.30
13	30 PLANNING, ENGINEERING, AND DESIGN	<b>Planning, Engineering, &amp; Design</b>	\$ 712,966	13%	\$ 94,928	\$ 807,894
14	31 CONSTRUCTION MANAGEMENT	<b>Construction Management</b>	\$ 402,752	17%	\$ 67,173	\$ 469,925
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)				\$ -	

<b>Totals</b>						
	Real Estate	\$	110,430	25%	\$ 27,608	\$ 138,037.50
	Total Construction Estimate	\$	3,619,382	19%	\$ 670,356	\$ 4,289,738
	Total Planning, Engineering & Design	\$	712,966	13%	\$ 94,928	\$ 807,894
	Total Construction Management	\$	402,752	17%	\$ 67,173	\$ 469,925
	Total Excluding Real Estate	\$	<b>4,735,100</b>	<b>18%</b>	<b>\$ 832,456</b>	<b>\$ 5,567,556</b>

Confidence Level Range Estimate (\$000's)	Base	50%	80%
		\$4,735k	\$5,235k

\* 50% based on base is at 5% CL.

<b>Fixed Dollar Risk Add:</b> (Allows for additional risk to be added to the risk analysis. Must include justification. Does not allocate to Real Estate.	
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## River Road TSP

Feasibility (Recommended Plan)

Abbreviated Risk Analysis

Meeting Date: 4-May-20

Risk Level					
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3
	Negligible	Marginal	Moderate	Significant	Critical

## Risk Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
<b>Project Management &amp; Scope Growth</b>						<b>40%</b>
PS-1	Demo of LWC	Low water crossing is a Historical feature.	Mitigation plans should be in place to capture requirements to avoid any delay or change to the project plan.	Negligible	Unlikely	0
PS-2	Modify LWC	Low water crossing is a Historical feature.	Mitigation plans should be in place to capture requirements to avoid any delay or change to the project plan.	Negligible	Unlikely	0
PS-3	Complete Removal of Ave A	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
PS-4	Partial Removal of Ave A	The PDT feels there are no concerns with this feature	No concerns for this section	Marginal	Possible	1
PS-5	Widen Golf Course path	The PDT feels there are no concerns with this feature	No concerns for this section	Marginal	Possible	1
PS-6	Partial Removal of River Road	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
PS-7	Recreation Features	City of SA wants concrete ADA paths at 8' wide instead of asphalt, and connect trails. Additional rail wood fence may be required for access control.	The change to concrete and adding connections could go above the allowable 10% and put additional costs on the sponsor.	Moderate	Very LIKELY	4
PS-8	Instream Structure	May need to change the size or quantities to avoid raising surface elevation,	If have to make larger or increase in the number, would have to add additional costs for more material and excavation.	Moderate	Unlikely	1
PS-9	Small Pedestrian Bridge/Light Duty Bridge	Approach walkways may be required.	Adding additional sidewalk to connect to from the bridge to the existing sidewalk areas.	Marginal	Likely	2
PS-10	Boulder Barrier	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
PS-11	Plantings	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0

PS-13	Planning, Engineering, & Design	No concerns for this section.	No concerns for this section	Negligible	Unlikely	0	
PS-14	Construction Management	No concerns for this section.	No concerns for this section	Negligible	Unlikely	0	
<b>Acquisition Strategy</b>						<b>Maximum Project Growth</b>	<b>30%</b>
AS-1	Demo of LWC	An aquisition plan has not been determined yet.	Will likley go small buisness, could have a marginal increase on cost dependant of market conditions at the time of solicitation.	Marginal	Likely	2	
AS-2	Modify LWC	An aquisition plan has not been determined yet.	Will likley go small buisness, could have a marginal increase on cost dependant of market conditions at the time of solicitation.	Marginal	Likely	2	
AS-3	Complete Removal of Ave A	An aquisition plan has not been determined yet.	Will likley go small buisness, could have a marginal increase on cost dependant of market conditions at the time of solicitation.	Marginal	Likely	2	
AS-4	Partial Removal of Ave A	An aquisition plan has not been determined yet.	Will likley go small buisness, could have a marginal increase on cost dependant of market conditions at the time of solicitation.	Negligible	Unlikely	0	
AS-5	Widen Golf Course path	An aquisition plan has not been determined yet.	Will likley go small buisness, could have a marginal increase on cost dependant of market conditions at the time of solicitation.	Negligible	Unlikely	0	
AS-6	Partial Removal of River Road	An aquisition plan has not been determined yet.	Will likley go small buisness, could have a marginal increase on cost dependant of market conditions at the time of solicitation.	Negligible	Unlikely	0	
AS-7	Recreation Features	An aquisition plan has not been determined yet.	Will likley go small buisness, could have a marginal increase on cost dependant of market conditions at the time of solicitation.	Negligible	Unlikely	0	
AS-8	Instream Structure	An aquisition plan has not been determined yet.	Will likley go small buisness, could have a marginal increase on cost dependant of market conditions at the time of solicitation.	Negligible	Unlikely	0	
AS-9	Small Pedestrian Bridge/Light Duty Bridge	An aquisition plan has not been determined yet.	Will likley go small buisness, could have a marginal increase on cost dependant of market conditions at the time of solicitation.	Negligible	Unlikely	0	
AS-10	Boulder Barrier	An aquisition plan has not been determined yet.	Will likley go small buisness, could have a marginal increase on cost dependant of market conditions at the time of solicitation.	Negligible	Unlikely	0	
AS-11	Plantings	No concerns for this section.	Assumption is LAERF will be taking care of planting just like many other projects in the area.	Negligible	Unlikely	0	
AS-13	Planning, Engineering, & Design	Most likely the construction piece would go AE contract, the plantings would go LAERF.	PDT feels it will not be an issue putting an AE contract in place.	Negligible	Unlikely	0	
AS-14	Construction Management	No concerns for this section.	No concerns for this section	Negligible	Unlikely	0	
<b>Construction Elements</b>						<b>Maximum Project Growth</b>	<b>15%</b>
CON-1	Demo of LWC	This is a common feature of work, need to make sure debris form removal does not end up in the creek to avoid changing the surface flow.	This is something done often, PDT feels there is no additional concern.	Negligible	Possible	0	
CE-2	Modify LWC	This is a common feature of work, need to make sure debris form removal does not end up in the creek to avoid changing the surface flow.	This is something done often, PDT feels there is no additional concern.	Negligible	Possible	0	

CE-3	Complete Removal of Ave A	This is removal of asphalt pavement. No additional concerns.	This is something done often, PDT feels there is no additional concern.	Negligible	Unlikely	0
CE-4	Partial Removal of Ave A	This is removal of asphalt pavement. No additional concerns.	This is something done often, PDT feels there is no additional concern.	Moderate	Likely	3
CE-5	Widen Golf Course path	This is a common feature of work.	This is something done often, PDT feels there is no additional concern.	Negligible	Unlikely	0
CE-6	Partial Removal of River Road	This is removal of asphalt pavement. No additional concerns.	This is something done often, PDT feels there is no additional concern.	Moderate	Unlikely	1
CE-7	Recreation Features	This is a common feature of work.	This is something done often, PDT feels there is no additional concern.	Negligible	Unlikely	0
CE-8	Instream Structure	These are typical J-Hook and vane structures.	These types have been done many tiems for civil projects, no concerns for construction.	Negligible	Unlikely	0
CE-9	Small Pedestrian Bridge/Light Duty Bridge	Would have to have equipment able to come in to form abutments on both sides, heavy equipment could work mostly from Ave A side.	Due to limited working space the work on the non Ave A side the abutments may take longer to build.	Marginal	Possible	1
CE-10	Boulder Barrier	Most likely all work would have to be completed with smaller equipment	If larger equipment is needed could cause delay due to accessability.	Marginal	Possible	1
CE-11	Plantings	For invasive species, if not able to maintain additional measures may have to take place.	Having to do a lot of manual removal could cause erosion issues that would need to be mitigaited adding additional cost to the project.	Marginal	Unlikely	0
CE-13	Planning, Engineering, & Design	The PDT feels the risk of not getting funding is not an issue for this piece.	No concerns for this section	Negligible	Unlikely	0
CE-14	Construction Management	Staging area for the project could be an issue.	Most available space is not desirable for residents in that area, may have to be placed on east side of river which could cause issues.	Marginal	Likely	2

<b>Specialty Construction or Fabrication</b>					<b>Maximum Project Growth</b>	<b>50%</b>
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SC-1	Demo of LWC	No specialty construction or fabrication for this feature	No concerns for this section	Negligible	Unlikely	0
SC-2	Modify LWC	No specialty construction or fabrication for this feature	No concerns for this section	Negligible	Unlikely	0
SC-3	Complete Removal of Ave A	No specialty construction or fabrication for this feature	No concerns for this section	Negligible	Unlikely	0
SC-4	Partial Removal of Ave A	No specialty construction or fabrication for this feature	No concerns for this section	Negligible	Unlikely	0
SC-5	Widen Golf Course path	No specialty construction or fabrication for this feature	No concerns for this section	Negligible	Unlikely	0
SC-6	Partial Removal of River Road	No specialty construction or fabrication for this feature	No concerns for this section	Marginal	Unlikely	0
SC-7	Recreation Features	No specialty construction or fabrication for this feature	No concerns for this section	Negligible	Unlikely	0
SC-8	Instream Structure	No specialty construction or fabrication for this feature	No concerns for this section	Negligible	Unlikely	0

SC-9	Small Pedestrian Bridge/Light Duty Bridge	Possible additoanl lead time required based on market conditions.	Unlikley that it would add a significant amont of time but if it did could be a marginal cost increase.	Marginal	Unlikely	0
SC-10	Boulder Barrier	No specialty construction or fabrication for this feature	No concerns for this section	Negligible	Unlikely	0
SC-11	Plantings	No specialty construction or fabrication for this feature	No concerns for this section	Negligible	Unlikely	0
SC-13	Planning, Engineering, & Design	The PDT feels the risk of not getting funding is not an issue for this piece.	There are no specialty construction of fabrication	Negligible	Unlikely	0
SC-14	Construction Management	The PDT feels the risk of not getting funding is not an issue for this piece.	There are no specialty construction of fabrication	Negligible	Unlikely	0

<b>Technical Design &amp; Quantities</b>				<b>Maximum Project Growth</b>		<b>20%</b>
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T-1	Demo of LWC	Could cause higher surface elevation, which is not allowed.	Running additnal runs to determine if a different option or planting scenario would have to be assumed.	Moderate	Unlikely	1
T-2	Modify LWC	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
T-3	Complete Removal of Ave A	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
T-4	Partial Removal of Ave A	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
T-5	Widen Golf Course path	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
T-6	Partial Removal of River Road	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
T-7	Recreation Features	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
T-8	Instream Structure	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
T-9	Small Pedestrian Bridge/Light Duty Bridge	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
T-10	Boulder Barrier	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
T-11	Plantings	The PDT feels there are no concerns with this feature	No concerns for this section	Negligible	Unlikely	0
T-13	Planning, Engineering, & Design	The PDT feels the risk of not getting funding is not an issue for this piece.	No concerns for this section	Negligible	Unlikely	0
T-14	Construction Management	The PDT feels the risk of not getting funding is not an issue for this piece.	No concerns for this section	Negligible	Unlikely	0

<b>Cost Estimate Assumptions</b>				<b>Maximum Project Growth</b>		<b>25%</b>
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EST-1	Demo of LWC	80% productivity level and based on qtys provided by civil design.	Productivity is based on limited space for equipment, if the productivity ends up being lower it would be a marginal increase in cost.	Marginal	Possible	1
EST-2	Modify LWC	80% productivity level and based on qtys provided by civil design.	Productivity is based on limited space for equipment, if the productivity ends up being lower it would be a marginal increase in cost.	Marginal	Possible	1
EST-3	Complete Removal of Ave A	80% productivity level and based on qtys provided by civil design.	Productivity is based on limited space for equipment, if the productivity ends up being lower it would be a marginal increase in cost.	Marginal	Possible	1
EST-4	Partial Removal of Ave A	80% productivity level and based on qtys provided by civil design.	Productivity is based on limited space for equipment, if the productivity ends up being lower it would be a marginal increase in cost.	Marginal	Possible	1
EST-5	Widen Golf Course path	80% productivity level and based on qtys provided by civil design.	Productivity is based on limited space for equipment, if the productivity ends up being lower it would be a marginal increase in cost.	Marginal	Possible	1
EST-6	Partial Removal of River Road	80% productivity level and based on qtys provided by civil design.	Productivity is based on limited space for equipment, if the productivity ends up being lower it would be a marginal increase in cost.	Moderate	Unlikely	1
EST-7	Recreation Features	The city may opt for more costly option, as long as within the 10% of the project, then it will be covered.	May change from asphalt to concrete trails.	Marginal	Possible	1
EST-8	Instream Structure	Construction for this sturture was based on previous project in SA. There is bank sculpting included with only a back of the napkin cross section for this portion.	Environmental felt this was the best example of feature required. The J hooks should be good, however the bank sculpting may have a lot of unknowns associated with it.	Marginal	Likely	2
EST-9	Small Pedestrian Bridge/Light Duty Bridge	Qtys provided by engineering and assume fabricated pedestrian bridges.	A different type of bridge would have a moderate cost effect, but is unlikely.	Moderate	Unlikely	1
EST-10	Boulder Barrier	80% productivity level and based on qtys provided by civil design.	Productivity is based on limited space for equipment, if the productivity ends up being lower it would be a marginal increase in cost.	Negligible	Unlikely	0
EST-11	Plantings	Planting costs based on information developed from environmental and LAERF.	Possibility that amount of required plantings could change, changing the overall costs. LAERF has been involved in a lot of Ft Worth civil projects so their availability is fairly certain.	Negligible	Possible	0
EST-13	Planning, Engineering, & Design	Currently based on 15% of the construction cost	Based on similar projects, this appears reasonable.	Negligible	Unlikely	0
EST-14	Construction Management	Currently based on a 12% of the construction cost	This could be higher based on level of effort but it would marginal.	Marginal	Possible	1

<b>External Project Risks</b>	<b>Maximum Project Growth</b>	<b>20%</b>
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EX-1	Demo of LWC	Neighborhood is reluctant about having construction, will likely have restrictive working hours	Could add additional time to the project or a need for additional crews to meet set POP.	Marginal	Very LIKELY	3
EX-2	Modify LWC	Neighborhood is reluctant about having construction, will likely have restrictive working hours	Could add additional time to the project or a need for additional crews to meet set POP.	Marginal	Likely	2
EX-3	Complete Removal of Ave A	Neighborhood is reluctant about having construction, will likely have restrictive working hours	Could add additional time to the project or a need for additional crews to meet set POP.	Marginal	Likely	2
EX-4	Partial Removal of Ave A	Neighborhood is reluctant about having construction, will likely have restrictive working hours	Could add additional time to the project or a need for additional crews to meet set POP.	Marginal	Likely	2

EX-5	Widen Golf Course path	Neighborhood is reluctant about having construction, will likely have restrictive working hours	Could add additional time to the project or a need for additional crews to meet set POP.	Marginal	Likely	2
EX-6	Partial Removal of River Road	Huge outcry over this feature, could impact project determination.	If this persists, it could cause a delay in the project or could cause the project to end before it starts.	Moderate	Possible	2
EX-7	Recreation Features	Neighborhood is reluctant about having construction, will likely have restrictive working hours	Could add additional time to the project or a need for additional crews to meet set POP.	Marginal	Possible	1
EX-8	Instream Structure	If a flood event the structures could be washed away if not in place correctly	If they do it will increase cost but is unlikely	Marginal	Unlikely	0
EX-9	Small Pedestrian Bridge/Light Duty Bridge	Neighborhood is reluctant about having construction, will likely have restrictive working hours	Could add additional time to the project or a need for additional crews to meet set POP.	Marginal	Possible	1
EX-10	Boulder Barrier	If a flood event the structures could be washed away if not in place correctly	If they do it will increase cost but is unlikely	Marginal	Unlikely	0
EX-11	Plantings	No concerns for this section.	No concerns for this section	Negligible	Unlikely	0
EX-13	Planning, Engineering, & Design	Adaptive Management may be challenging with people removing vegetation or tramping, and having to replace to maintain growth.	May add additional costs to the adaptive management throughout the course of the growing season.	Marginal	Likely	2
EX-14	Construction Management	Having resources to be able to manage project due to the amount of USACE projects currently in the queue.	If more resources are required than what is available in the district, this could cause a marginal increase.	Marginal	Possible	1

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: **River Road**  
 PROJECT NO: **XXXXXX**  
 LOCATION: **River Road, TX**

DISTRICT: **Fort Worth**

PREPARED: **7/27/2020**

POC: **CHIEF, COST ENGINEERING, Ninfa Taggart**

This Estimate reflects the scope and schedule in report; River Orad Feasibility Report

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	Program Year (Budget EC): Effective Price Level Date:			2021 1-Oct-20 Spent Thru: <b>1-Oct-15</b> (\$K)	TOTAL FIRST COST (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
							COST (\$K)	CNTG (\$K)	REMAINING COST (\$K)						
06	Demo LWC	\$250	\$65	26%	\$315	3.8%	\$260	\$68	\$327	\$327	4.4%	\$271	\$70	\$341	
06	Remove Ave A	\$266	\$56	21%	\$322	3.8%	\$276	\$58	\$335	\$335	4.4%	\$289	\$61	\$349	
06	Construct Golf Path	\$37	\$6	17%	\$43	3.8%	\$38	\$7	\$45	\$45	4.4%	\$40	\$7	\$47	
06	Planting	\$521	\$52	10%	\$573	3.8%	\$541	\$54	\$595	\$595	5.1%	\$569	\$57	\$626	
08	Light Duty bridge/Small Ped bridge	\$1,372	\$274	20%	\$1,647	4.6%	\$1,436	\$287	\$1,723	\$1,723	4.4%	\$1,499	\$300	\$1,798	
14	Recreation Facilities	\$243	\$80	33%	\$323	1.6%	\$247	\$81	\$328	\$328	5.1%	\$259	\$86	\$345	
15	InStrem Structures	\$773	\$124	16%	\$896	3.8%	\$802	\$128	\$930	\$930	5.1%	\$843	\$135	\$978	
15	Boulder Barrier	\$157	\$19	12%	\$176	3.8%	\$163	\$20	\$182	\$182	8.2%	\$176	\$21	\$197	
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$3,619	\$676		\$4,296	4.0%	\$3,764	\$703	\$4,466	\$4,466	4.8%	\$3,946	\$736	\$4,682	
01	LANDS AND DAMAGES	\$110	\$28	25%	\$138	4.3%	\$115	\$29	\$143	\$143		\$115	\$29	\$143	
30	PLANNING, ENGINEERING & DESIGN	\$713	\$93	13%	\$806	8.8%	\$776	\$101	\$877	\$877	5.0%	\$815	\$106	\$921	
31	CONSTRUCTION MANAGEMENT	\$403	\$69	17%	\$472	8.8%	\$438	\$75	\$513	\$513	#####	\$486	\$83	\$569	
<b>PROJECT COST TOTALS:</b>		\$4,846	\$865	18%	\$5,711		\$5,093	\$907	\$5,999	\$5,999	5.3%	\$5,361	\$953	\$6,314	

CHIEF, COST ENGINEERING, Ninfa Taggart

PROJECT MANAGER, Zia Burns

CHIEF, REAL ESTATE, Rocky Lee

CHIEF, PLANNING, XXX

CHIEF, ENGINEERING, Mark Black

CHIEF, OPERATIONS, XXX

CHIEF, CONSTRUCTION, XXX

CHIEF, CONTRACTING, XXX

CHIEF, PM-PB, xxxx

CHIEF, DPM, XXX

**ESTIMATED TOTAL PROJECT COST: \$6,314**

ESTIMATED FEDERAL COST: **65%** \$4,104

ESTIMATED NON-FEDERAL COST: **35%** \$2,210

**22 - FEASIBILITY STUDY (CAP studies): \$622**

ESTIMATED FEDERAL COST: 50% \$361

ESTIMATED NON-FEDERAL COST: 50% \$261

**ESTIMATED FEDERAL COST OF PROJECT \$4,465**

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: River Road  
LOCATION: River Road, TX  
This Estimate reflects the scope and schedule in report; River Orad Feasibility Report

DISTRICT: Fort Worth  
POC: CHIEF, COST ENGINEERING, Ninfa Taggart

PREPARED: 7/27/2020

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>6-May-16</b>		Estimate Price Level: 1-Oct-18		Program Year (Budget EC): 2021		Effective Price Level Date: 1 -Oct-20						
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>CONTRACT 1</b>														
06	Demo LWC	\$250	\$65	26.0%	\$315	3.8%	\$260	\$68	\$327	2022Q3	4.4%	\$271	\$70	\$341
06	Remove Ave A	\$266	\$56	21.0%	\$322	3.8%	\$276	\$58	\$335	2022Q3	4.4%	\$289	\$61	\$349
06	Construct Golf Path	\$37	\$6	17.0%	\$43	3.8%	\$38	\$7	\$45	2022Q3	4.4%	\$40	\$7	\$47
06	Planting	\$521	\$52	10.0%	\$573	3.8%	\$541	\$54	\$595	2022Q4	5.1%	\$569	\$57	\$626
08	Light Duty bridge/Small Ped bridge	\$1,372	\$274	20.0%	\$1,647	4.6%	\$1,436	\$287	\$1,723	2022Q3	4.4%	\$1,499	\$300	\$1,798
14	Recreation Facilities	\$243	\$80	33.0%	\$323	1.6%	\$247	\$81	\$328	2022Q4	5.1%	\$259	\$86	\$345
15	InStrem Structures	\$773	\$124	16.0%	\$896	3.8%	\$802	\$128	\$930	2022Q4	5.1%	\$843	\$135	\$978
15	Boulder Barrier	\$157	\$19	12.0%	\$176	3.8%	\$163	\$20	\$182	2023Q4	8.2%	\$176	\$21	\$197
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$3,619	\$676	18.7%	\$4,296		\$3,764	\$703	\$4,466			\$3,946	\$736	\$4,682
01	LANDS AND DAMAGES	\$110	\$28	25.0%	\$138	4.3%	\$115	\$29	\$143	2021Q1		\$115	\$29	\$143
30	PLANNING, ENGINEERING & DESIGN													
1.2%	Project Management	\$42	\$5	13.0%	\$47	8.8%	\$46	\$6	\$52	2021Q3	2.1%	\$47	\$6	\$53
1.0%	Planning & Environmental Compliance	\$36	\$5	13.0%	\$41	8.8%	\$39	\$5	\$44	2021Q3	2.1%	\$40	\$5	\$45
6.7%	Engineering & Design	\$242	\$31	13.0%	\$273	8.8%	\$263	\$34	\$297	2021Q3	2.1%	\$269	\$35	\$304
1.0%	Reviews, ATRs, IEPRs, VE	\$36	\$5	13.0%	\$41	8.8%	\$39	\$5	\$44	2021Q3	2.1%	\$40	\$5	\$45
1.0%	Life Cycle Updates (cost, schedule, risks)	\$36	\$5	13.0%	\$41	8.8%	\$39	\$5	\$44	2021Q3	2.1%	\$40	\$5	\$45
1.0%	Contracting & Reprographics	\$36	\$5	13.0%	\$41	8.8%	\$39	\$5	\$44	2023Q4	10.9%	\$43	\$6	\$49
2.0%	Engineering During Construction	\$72	\$9	13.0%	\$81	8.8%	\$78	\$10	\$88	2023Q4	10.9%	\$87	\$11	\$98
2.0%	Planning During Construction	\$72	\$9	13.0%	\$81	8.8%	\$78	\$10	\$88	2021Q3	2.1%	\$80	\$10	\$90
4.0%	Adaptive Management & Monitoring	\$105	\$14	13.0%	\$119	8.8%	\$115	\$15	\$129	2024Q2	12.9%	\$129	\$17	\$146
1.0%	Project Operations	\$36	\$5	13.0%	\$41	8.8%	\$39	\$5	\$44	2021Q3	2.1%	\$40	\$5	\$45
31	CONSTRUCTION MANAGEMENT													
6.7%	Construction Management	\$241	\$41	17.0%	\$282	8.8%	\$262	\$45	\$307	2023Q4	10.9%	\$291	\$49	\$340
2.0%	Project Operation:	\$72	\$12	17.0%	\$84	8.8%	\$78	\$13	\$92	2023Q4	10.9%	\$87	\$15	\$102
2.5%	Project Management	\$90	\$15	17.0%	\$105	8.8%	\$98	\$17	\$115	2023Q4	10.9%	\$109	\$18	\$127
<b>CONTRACT COST TOTALS:</b>		\$4,846	\$865		\$5,711		\$5,093	\$907	\$5,999			\$5,361	\$953	\$6,314